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## **The adaptability of companies in the automotive sector to the ban on internal combustion vehicles in Europe from 2035**

Gonçalo Pereira Alves Sampaio da Nóvoa

Master in Management

Supervisor:

Doctor Renato Telo de Freitas Barbosa Pereira, Professor of General Management, ISCTE-IUL Business School,

November, 2022



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## **Acknowledgements**

To begin with, I want to thank Prof. Dr. Renato Pereira for the guidance of this thesis, always based on a rigorous and demanding approach that significantly expanded my knowledge and that, with his collaboration and support in scientific and personal terms, allowed me to carry out this work.

A word of thanks to all those who collaborated in filling out my questionnaire because they made this study possible, not only for their availability but also for their interest in this research. I hope the results contribute, in some way, so that companies in the automotive sector, together, continue to adapt to successfully meet the objective imposed by the European Union of banning the sale of new petrol and diesel cars from 2035.

Finally, I would like to thank my family and close friends for their patience and emotional support throughout my absences. To them, I dedicate this work.

## **Resumo**

A presente dissertação explora um tema de grande atualidade, com presença quase diária na imprensa e nas preocupações dos cidadãos. Embora a questão da adaptabilidade das empresas à mudança, respeite a uma diversidade de áreas de investigação, centrei o meu estudo num domínio intensamente afetado – o Setor Automóvel –, por ser uma área que me suscita particular interesse.

A perceção de que, a nível mundial, há uma mudança rápida a ocorrer na mobilidade e transporte, aliada ao facto de as empresas do setor automóvel e de mobilidade precisarem de se adaptar prontamente às necessidades do mercado, determinaram o meu interesse na investigação do tema.

Este trabalho visa identificar os fatores que condicionam a adaptabilidade das empresas do sector automóvel ao novo paradigma, que surgirá em 2035. O objetivo do estudo é a análise da relação entre comportamento de cidadania organizacional, motivação intrínseca, comportamento criativo, comportamento de voz focado no problema e construções de compromisso afetivo e variáveis demográficas tais como idade, nível de educação e permanência no emprego.

Resultou deste estudo a avaliação da reação, adaptações e inovações adotadas pelas empresas do setor automóvel. O estudo baseia-se num questionário organizacional, respondido por 64 trabalhadores de empresas portuguesas do setor automóvel, através de Microsoft Forms.

Este estudo organiza-se em duas partes: na primeira, apresento o quadro teórico, caracterizo a inovação e a adaptabilidade, a relação entre estes dois fatores e a análise do caso no Setor Automóvel; na segunda parte, apresento o estudo empírico recolhido no questionário acima referido.

**Palavras-chave:** Setor automóvel; Objetivos Net-Zero; Mobilidade sustentável; Inovação; Adaptabilidade.

**Classificação JEL:** Geral; O3 - Inovação, Pesquisa e Desenvolvimento, Mudança Tecnológica, Direitos de Propriedade Intelectual; O30 – Geral

## **Abstract**

This dissertation explores a topic of great actuality, with an almost daily presence in the press and on people's minds. Although the adaptability of companies to change is a diverse research area, the study focuses on an intensely affected domain, the Automotive Sector, for being an area that raised my particular interest.

The realisation that there is a rapid change occurring in the world's mobility and transportation, allied to the fact that companies in the automotive and mobility sector need to reshape to fit the market needs promptly, is what attracted me to investigate this theme.

This paper aims to identify the factors that condition the adaptability of companies in the automotive sector to the new paradigm that will emerge in 2035. For this reason, the study's objective is to analyse the relationship between organisational citizenship behaviour, intrinsic motivation, creative behaviour, problem-focused voice behaviour and affective commitment constructs and demographic variables such as age, level of education and job tenure.

This study assessed the reactions, adaptations, and innovations adopted by companies in the automotive sector. The study is based on an organisational questionnaire answered by 64 workers in Portuguese companies in the automotive sector through a Microsoft Forms link.

This study is organised in two parts: in the first, I present the theoretical framework, I characterise innovation and adaptability, the relationship between these two factors and the analysis of the case in the Automotive Sector; In the second part, I present the empirical study collected from the questionnaire above mentioned.

**Keywords:** Automotive sector; Net-Zero Goals; Sustainable mobility; Innovation; Adaptability.

**JEL Classification System Code:** O3 – Innovation, Research and Development, Technological Change, Intellectual Property Rights; O30 – General

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## **Glossary**

EU – European Union

EV – Electric Vehicle

BEV – Battery Electric Vehicle

ICE – Internal Combustion Automobile

IEA – International Energy Agency

OCB – Organisational Citizenship Behaviour



## Introduction

Transport is considered a backbone element of society and the economy, connecting the markets and the people. Having brought many benefits, Transport is also to blame for the immense environmental problems facing the world (Raugei et al., 2021).

Only in recent years have electric vehicles (EVs) started to gain importance and thrive in the market. This happened mainly due to three main elements: supportive regulatory frameworks, backed up by the increase in environmental concerns, additional incentives to safeguard EV sales from the economic downturn, and the fall in battery costs resulting from expanding the number of EV models on the market. These three pillars have helped to reduce carbon emissions and improve the air quality we breathe in the last few years (“Global EV Outlook 2021 – Analysis - IEA,” 2021).

A ban on the sale of new petrol and diesel cars from 2035 was proposed on July 14th 2021 by the European Union, aiming to cut cars’ CO<sub>2</sub> emissions by 55% in 2030 and by 100% in 2035 (Carey & Steitz, 2021). These policies to combat global warming establish the impossibility of selling new fossil fuel-powered vehicles in the 27 EU countries by 2035, which could crash the used car market, especially the fossil fuel-powered used market.

The new car sales scene in the European Union has changed radically in just two years. In the first half of 2019, more than half a million electrified vehicles and 7.3 million vehicles with internal combustion engines were sold. Two years later, in the first half of 2021, 1.8 million electrified and 3.4 million diesel and gasoline cars were sold (“Fuel Types of New Cars: Battery Electric 7.5%, Hybrid 19.3%, Petrol 41.8% Market Share in Q2 2021,” 2021).

What’s more, just in the first nine months of 2021, more battery electric vehicles (BEV) were sold than in the whole year of 2020 (The European Automobile Manufacturers’ Association, 2021). Observing the evidence, in Germany, more electric cars were registered than diesel ones (“Pressemitteilungen-Fahrzeugzulassungen Im September 2021,” 2021).

However, the transition to a future without gasoline and diesel cars comes with unintended consequences, such as, around five hundred thousand people in Europe may lose their jobs. Three hundred thousand new jobs can be gained with the transition to electric cars, but retraining is needed (Carey, 2021). With this massive search for electric-powered vehicles, changes need to be made in the automotive and mobility sectors to adapt and keep up with this growth.

As observed, “adaptability is defined as the dynamic capacity to effect and unfold multiple evolutionary trajectories, through loose and weak couplings between social agents in

place, that enhance the overall responsiveness of the system to unforeseen changes.” (Pike et al., 2010, p.62); in other words, it all depends on how the organisations perceive the situation in terms of their ability or tolerance to face the changing situation, resulting in positive or negative consequences for the organisation itself.

This research is focused on this particular setting and situation. As Gibson and Birkinshaw (2004) state, activities focused on adaptability are designed with the goal of enhancing performance throughout the course of a more extended period of time. This scenario is frequently the result of a changing business landscape. Similarly, the author argues that organisations may improve their adaptability by increasing their knowledge and capacity to respond. These lock-ins limit their adaptability in the face of disruptive change.

Following the review of several bibliographical sources, it was discovered that adaptability and agility are related to one another in various ways. Organisations must be nimble enough to respond quickly and effectively to new opportunities and challenges to thrive in today’s fast-paced, ever-evolving business environment. The concept of adaptability may be used to describe a distinct kind of resilience and may be required to deal with the unpredictability of the future (Pike et al., 2010).

In this sense, the study’s objective is to analyse the relationship between organizational citizenship behaviour, intrinsic motivation, creative behaviour, problem-focused voice behaviour and affective commitment constructs and demographic variables such as age, level of education and job tenure. This objective allowed an evaluation of how companies in the automotive sector react, adapt and innovate to provide answers to these incoming challenges. Pursuing this objective also allowed to learn the differences between adaptability and agility and to determine whether there is a connection between innovation and adaptability to the market’s changing needs and demands.

The reason for selecting this subject was the pertinence of the contemporary importance of the subject, not only for the sector but also for the global economy and the environment, which led to the consideration of studying it in the pursuit of a deeper understanding of the topic. Throughout the bibliographic research, numerous studies were carried out with various types of companies from different sectors of activity and industries (manufacturing, software, banking, insurance, oil and gas, engineering, logistics, and supply chain companies). However, no references were discovered on this topic focusing on the automotive sector.

Several scholars point to adaptability as a key factor in why certain businesses are better able to handle and react to the unexpected. This study aims to examine the role that the need to

adapt to changes in the sector plays in the development of adaptability, as well as how this trait influences the functions performed by these professionals and their level of job satisfaction.

This work is structured into two main parts to achieve the proposed objectives. In the first part (Part A), the theoretical framework is presented, starting in Chapter 1 by characterising the change in the business environment, defining adaptability, agility and their dimensions, and analysing what affects agility, its main explanatory models, causes, and drivers. In this way, the study starts with understanding agility, its importance in modifying the business climate, and how it relates to adaptability. In Chapter 2, several studies on adaptability in different sectors of activity are described, analysing the differences found to verify that this phenomenon is transversal to several sectors, not only the automotive sector.

In the second part of the work (Part B), the empirical studies are presented, describing in Chapter 3 the methodology used and the data collection procedures. Finally, in Chapter 4, the data obtained from the questionnaire is presented and discussed. To conclude, some findings and limitations for future study are offered, with references to the consulted and presented literature.

## **Part A - Theoretical Framework**

## **Chapter 1 – Theme and Background**

### **1. Background**

The purpose of this first chapter is to establish the link between adaptability and agility. Given the significance of adaptability in the business environment, this research attempted to define it, separate it from others, describe some of the primary theoretical approaches to adaptability and address its determinants.

### **2. Change in the Business Environment - Agility and Adaptability**

With global economic and political upheavals comes the emergence of a new business era. In today's business climate, organisations must adapt and develop, proactively approaching the market and consumer demands using newly evolved collaboration approaches (Sharifi & Zhang, 1999).

According to O'Reilly III and Tushman (2008), an organisation that has a comprehensive awareness of the shifting business landscape, as well as a diverse set of skills and abilities, is able to handle uncertainty and capture opportunities with ease.

Sharifi and Zhang (1999) argue that continuous change, fast reaction, quality improvement, and social responsibility are the fundamental pillars of competitive criteria for this new age. The same authors observed that while recognised as a strategy to overcome challenging times and uncertainty, these quick and drastic changes may also be the source of most business failures (Sharifi & Zhang, 1999).

Professor Leon C. Megginson believes "it is not the most intellectual of the species that survives; it is not the strongest that survives, but ... the one that is able best to adapt and adjust to the changing environment in which it finds itself." Sharifi and Zhang (1999) have stressed that organisations may be agile if they have the core abilities to recognise and grasp their changing surroundings, effectively responding to any unexpected shift. Prioritising time and flexibility, organisations can exploit changes as opportunities in these unpredictable settings.

O'Reilly III and Tushman (2008), when trying to resolve the innovator's dilemma, proposed an exciting and challenging question - How do organisations deal with change? Can organisations adapt, and if so, how? There are two schools of thought on the subject; one believes they can, while the other believes they cannot (O'Reilly III & Tushman, 2008).

The first contends that some businesses learn to adapt to changing environmental situations. The latter, based on organisational ecology, suggests that most organisations are stagnant and eventually collapse.

This second perspective connects two subjects based on strategy research. One contends that dynamic capabilities explain long-term competitive advantage or a firm's capacity to reconfigure assets and current capabilities. The other, based on organisational architecture, contends that ambidexterity, a firm's ability to explore and exploit simultaneously, allows it to adapt over time.

Hamal and Välikangas (2003) recognise that technological breakthroughs, regulatory reforms, and geopolitical shocks play a substantial part in degrading corporate structures. The authors outline that businesses that have always been profitable are struggling, earnings for firms are volatile and performance breaks are getting increasingly frequent. Therefore, firms can no longer rely on momentum and incumbency to sustain performance. Instead, firms require strategic resilience.

Defined by Hamal and Välikangas as the ability to dynamically reinvent business models and strategies in response to changing circumstances, strategic resilience implies continuous anticipation of and response to changes that threaten their elemental earning power. These measures ensure effective business adaptation before the circumstances become critical (Hamal & Välikangas, 2003).

Doz and Kosonen's work has tried to create a repertoire of leadership practices to facilitate the renewal and transformation of business models. To begin with, "business models" contain factual and subjective meanings. They are structured and interdependent operational interactions between an organisation and its customers, suppliers, complementors, partners, and other stakeholders, as well as its internal divisions and departments. Nonetheless, business models serve as a subjective representation of these processes for the organisation's management, defining how the firm interacts with its environment. As a result, business models are cognitive constructs that provide a theory for defining limits for the organisation, producing value, and organising its internal structure and governance (Doz & Kosonen, 2010).

## **2.1. Agility**

### **2.1.1. Definition of Agility**

Agility is an ability and character trait every organisation must possess to survive and thrive in the modern global economic climate. Sharifi and Zhang (1999) define agility as sensing changes in the business environment and responding to them by delivering the necessary skills. According to Katayama and Bennett (1999), it is the interface between the firm and the market. Essentially, a collection of skills for satisfying a wide range of client expectations in terms of pricing, specification, quality, quantity and delivery (Katayama & Bennett, 1999). Ding, Kam, and Lalwani (2012) describe agility as a company's capacity to swiftly assess and adapt to changing consumer requirements.

As a competitive advantage facilitator, agility includes accelerated delivery services, rapid reaction to client demands and flexible delivery schedules. Firm success benefits from the capacity to adapt to market shifts in a highly competitive and changing market context, where agility plays a critical role (Ding et al., 2012). Teece, Peteraf, and Leih (2016) define it similarly as the ability to make rapid, effective, and sustained organisational transformation a repeatable organisational resource. In principle, agility consists of two primary factors: adapting to and exploiting change. It is sometimes portrayed as a higher-order dynamic capacity gained through time (Teece et al., 2016). Agility is also constructed by reacting appropriately and quickly and capitalising on developments as opportunities (Sharifi & Zhang, 1999).

Organisations require different levels of agility depending on how they adapt to changing business conditions (Sharifi & Zhang, 1999). An organisation with a thorough awareness of the changing business landscape, a diverse set of skills and abilities to handle uncertainty can better capitalise on opportunities (O'Reilly III & Tushman, 2008). Agility is a response to a company's changes and can become a company's distinguishing feature and competitive advantage (Sharifi & Zhang, 1999). As a result, the way a firm should operate in turbulent business situations, known as agility, is a direct consequence of changes in the business environment and in the company's condition (Sharifi & Zhang, 1999).

In theory, agility is a strategic reaction to new business criteria; in practice, it is a strategic use of business techniques, manufacturing and management processes, practices and tools, the majority of which have been previously created and utilised by industries for specific objectives. Some are being developed to help with the capabilities necessary for agility. However, it is unanimously accepted that agility significantly impacts how a firm adapts and

flourishes in the market. Companies must recognise and anticipate changes in their business environment to adapt. Agility also aids in coping with instability and grasping the business's practical side (Sharifi & Zhang, 1999).

Agility requirement levels vary in how businesses adapt to changes. It is divided into three parts: agility drivers, changes in the business environment that force the organisation to take a different approach to conduct their business, and the quest for competitive advantage through agility providers. The second section outlines the fundamental capabilities required to respond to changes. Agility capabilities and agility practices that interact with agility drivers provide a viable method for a company to adopt agility (Sharifi & Zhang, 1999).

According to Katayama and Bennett (1999), delivering value to the client, being ready for change, respecting human knowledge, and skills and building virtual collaborations are the four fundamental concepts of agility. Recognising that significant technical improvements can result in agility is equally critical.

It is important to notice that the terms “agility” and “adaptability” are frequently used interchangeably. Agility is described as a business's proactive evolution to prosper, while adaptability is defined as a business's capacity to react to these changes (Sharifi & Zhang, 1999). This characteristic of the company's production system is its inherent capacity to alter or vary its cost performance in response to demand (Katayama & Bennett, 1999). These are mutually reinforcing principles that, when combined, boost competitiveness and survival chances in an increasingly uncertain and global economic environment (Katayama & Bennett, 2010).

### **2.1.2. The dimensions of agility**

The publications previously mentioned were focused on the market's fast shift and the importance of adopting new views and rethinking established beliefs and mindsets. They provide a distinct strategy beyond standard models that might enable organisations to adapt favourably to changing circumstances and capitalise on them. Organisations can only do this by altering how they look at their company, their connections with consumers, suppliers and their collaboration with rivals. The change in mentality, that is required to accomplish this objective, should support a new strategic vision that goes beyond existing systems and moves the focus of competition to other dimensions than price and quality (Sharifi & Zhang, 1999).

It is possible for companies to endure and thrive in these challenging circumstances if they have the capability to recognise and grasp their shifting environments and adapt effectively



to any unanticipated change by evaluating the many dimensions of agility (Sharifi & Zhang, 1999).

Sharifi and Zhang (1999) distinguish three types of agility: agility drivers, capabilities and practice. Other scholars identified exploration, exploitation, and ambidexterity also as agility aspects to be considered (O'Reilly III & Tushman, 2008, p. 189). According to Sharifi and Zhang (1999), these dimensions attempt to identify, analyse and recognise a change. This allows the organisation to go on to the next stage and define the necessary competencies to challenge and overcome change. The authors suggest that the next phase would be to define the needed strategies, identify the practices or projects that may aid in achieving the requisite skills and include them in the company's action plan. Organisations must then assess and analyse their agility performance and, if necessary, correct it depending on the results of the performance measurement (Sharifi & Zhang, 1999).

Exploitation, according to O'Reilly III and Tushman (2008), is about efficiency, improving productivity, control, certainty and variance reduction; whereas exploration is about search, discovery, autonomy, invention and embracing variation; ambidexterity is about doing both. Ambidexterity requires a balance between the beforementioned two aspects (exploration and exploitation), although there seems to be a great struggle to do so without biasing towards exploitation. Organisations can use what they already know more efficiently if they realise this frequently unconscious exploitation bias. Otherwise, such organisations will eventually become obsolete and collapse; this was further explored in the topic of "dynamic capabilities".

However, returns on exploration are not explicitly evident, further distant in time and frequently a challenge to be achieved by established organizational units. As a result of these characteristics, firms usually have less success in exploration and become more vulnerable to technological improvements and market changes (O'Reilly III & Tushman, 2008).

To attain long-term success, organisations are required to have the operational capabilities and competencies so as to thrive in existing markets, the capacity to recombine and reconfigure assets and organisational structures to adapt to developing markets and technologies (O'Reilly III & Tushman, 2008).

Leadership goals and actions provide the dynamic capabilities required to speed the renewal and transformation of business models, increasing the likelihood of such initiatives succeeding (Doz & Kosonen, 2010). In organisational terms, according to O'Reilly III and Tushman (2008), "dynamic capabilities" are the basis of a company's capacity to be ambidextrous. To compete in both mature and growing markets simultaneously, organisations must be best capable of exploring and exploiting (O'Reilly III & Tushman, 2008). In demand

exploitation, a short-term perspective, efficiency, discipline, incremental growth and constant innovation are essential success factors. The alignment required for exploration is not the same as that required for competencies, systems, structure and culture. Critical success factors include a broader time horizon, increased autonomy, flexibility, risk-taking, less formal processes and control (O'Reilly III & Tushman, 2008).

Organisational alignments associated with exploitation and exploration differ and are inconsistent, yet both are essential for the firm to thrive and achieve short-term growth. Nevertheless, organisations need to be on the lookout for two recognised traps if they cannot hold inconsistent alignments: the "competency trap", in which success leads to repetition and exploitation drives out exploration; or the "failure trap", in which inexperience leads to failure and constant shifting in alternatives drives out exploration (O'Reilly III & Tushman, 2008).

At this point, what capabilities do organisations require to succeed at ambidexterity? Ambidexterity demands a coherent alignment of competencies, structures and cultures for exploration; a contrasting congruent alignment for exploitation; a senior leadership team with the cognitive and behavioural flexibility to establish and nurture both, according to Teece's three-part sensing, seizing and reconfiguring taxonomy (Teece, 2007).

Ambidexterity, as a dynamic capability, assists organisations in detecting and seizing new possibilities to mitigate the disadvantages of route dependency (O'Reilly III & Tushman, 2008).

### **2.1.3. Main explanatory models of Agility**

#### **2.1.3.1. Organizational Agility**

Teece, Peteraf, and Leih (2016) describe organisational agility as the ability to handle uncertainty successfully, which is almost synonymous with "flexibility". Strategy agility, according to Doz and Kosonen (2010), is the ability to continually alter and adapt strategic direction in the core business to produce value for the organisation. These academics agree that the function of organisational agility in modern management cannot be evaluated independently from risk, uncertainty, budgets, costs, commitment and strategy. Increasing organisational agility sometimes implies compromising technological efficiency. Managers require a broad (integrative) framework to deal successfully with complex, interconnected challenges (Teece et al., 2016).

The traits required to respond to adversity differ from those required to capitalise on adversity (Teece et al., 2016). Adaptability is a crucial weapon in the hands of talent management when there is uncertainty. The dynamic capabilities framework is helpful for understanding agility since it provides a comprehensive foundation. Taking flexibility into account can help managers make better decisions and researchers better understand management issues in the innovation economy (Teece et al., 2016, pp. 17-18).

Organisational agility is frequently viewed by Teece, Peteraf and Leih (2016), as an unchanging virtue, meaning that organisations must be in a permanent state of transition. This disregards the fact that these modifications are needless and may be impossible (Teece et al., 2016). Strong dynamic capabilities are required to develop the organisational agility needed to deal with profound uncertainty, such as that generated by innovation and the resulting dynamic competition (Teece et al., 2016).

Deep uncertainty pervades interrelated, interdependent economies that are experiencing rapid technological growth. Economic and financial concepts, methodologies, and insights from organisational and management theory were deployed to highlight situations where maintaining organisational agility is functional, if not required (Teece et al., 2016). Businesses must consistently innovate, not only during times of crisis. Organisations must adjust to stay competitive as uncertainty grows. Change is expensive, and attaining agility requires compromising efficiency. Businesses should plan for agility since they never know when it may be necessary (Teece et al., 2016).

While the efficiency-flexibility trade-off cannot be avoided, organisations with superior dynamic skills understand when to sacrifice efficiency for agility. They should also obtain better agility/efficiency trade-offs (Teece et al., 2016); "When there is ambiguity, doing the right thing is more essential than doing the right thing" (Teece et al., 2016, p. 15). Effective entrepreneurial management is vital to achieving organisational agility (Teece et al., 2016).

### **2.1.3.2. Dynamic Capabilities**

Teece, Peteraf and Leih (2016), posed an interesting question when studying organisational performance: what circumstances cause certain organisations to maintain their competitive edge when presented with environmental shifts while others do not? This led to the birth of the "dynamic capabilities" approach, which emphasises the critical role of strategic leadership in correctly adapting, integrating and reconfiguring organisational skills and resources to changing contexts (O'Reilly III & Tushman, 2008).

However, the framework of dynamic capabilities has several interpretations and each scholar appears to describe it differently. Teece et al. defined it as a framework designed to help managers to rethink their objectives without market mechanisms to avoid uncertainty (Teece et al., 2016). O'Reilly III and Tushman (2008), described the notion as a framework for restructuring assets to capitalise on new opportunities. According to Teece et al. (2016), dynamic capabilities characterise a firm's ability to innovate, adapt to change and produce change that benefits consumers while being detrimental to rivals. Its effects impact an organisation's capacity to change.

In organisational terms, dynamic capabilities are at the heart of a company's capacity to be ambidextrous in its exploration and exploitation. Companies can use dynamic capabilities to build, deploy and safeguard intangible assets that promote improved long-term business performance (O'Reilly III & Tushman, 2008).

Also, dynamic capabilities are corporate capabilities that value the enterprise's ability to impact the environment in which it operates, create new goods and processes and build and implement successful business models (Teece, 2007). These capabilities produce change that benefits consumers while harming competitors (Teece et al., 2016), enhancing coordination and allowing them to acquire organisational learning (O'Reilly III & Tushman, 2008).

Senior leaders must be able to cultivate and hone these assets and be flexible enough to reorganise them in response to changing circumstances. Although dynamic capabilities may offer a competitive edge at any particular moment, managers need to reallocate resources away from established and declining companies and toward new growth possibilities if they want to succeed in the long run (O'Reilly III & Tushman, 2008).

Rearranging resources, and reorganising operations in response to shifting market conditions as well as to technological developments is essential for achieving and maintaining profitable growth. To gain a competitive advantage, a firm needs not only dynamic skills but also the formation of strategic plans to be developed and executed simultaneously. According to the dynamic capabilities framework, the top management role is to identify a possible critical change or trend, plan an appropriate response and execute or perform concrete and applicable actions to steer the company toward the new opportunity, getting closer to its ultimate goals (Teece et al., 2016).

### **2.1.3.2.1. Ambidexterity**

Described by O'Reilly III and Tushman (2008) as the firm's ability to "learn how to learn", ambidexterity requires effectiveness from businesses and may be used to encourage exploration and exploitation. This dynamic capability demands a cohesive and consistent alignment of competencies, structures, and cultures, as well as a senior leadership team with the cognitive and behavioural flexibility to build and foster them both (O'Reilly III & Tushman, 2008).

Moreover, the capacity to simultaneously achieve alignment and adaptability at the business-unit level is a second viewpoint on ambidexterity mentioned in the literature (Gibson & Birkinshaw, 2004). The higher the chance of ambidexterity, the more dynamic the firm's environment is (O'Reilly III & Tushman, 2008), as it assists organisations to detect and seize new potential opportunities, while also supporting them in mitigating the disadvantages of route dependency. In this context, ambidexterity does not imply random variation or accepting inefficiency but rather a planned strategy that reconfigures existing corporate assets and capacities to address new possibilities (O'Reilly III & Tushman, 2008).

Ambidexterity represents a complicated collection of processes such as decentralisation, differentiation, and targeted integration. It can only be considered a dynamic capability if the firm's assets and resources can be controlled regularly (O'Reilly III & Tushman, 2008).

### **2.1.4. Causes of Agility and Agility Drivers**

The number of modifications and their types, specifications, or features cannot be easily detected and is most likely infinite. A wide-ranging of firms with diverse qualities and operating in unique environments may confront distinct and possibly unique changes (Sharifi & Zhang, 1999).

Contrastingly, when an organization takes a detrimental or erroneous action, a competitor can take advantage of the situation and improve accordingly. Nevertheless, the missed step might also be a learning opportunity for the organization itself, even if that opportunity is seized at a different time or location. There are common characteristics in developments that may have a broad influence on any organisation (Ding et al., 2012).

Being agile requires being aware of the organisation's and competitors' movements, along with being able to analyse and take immediate and appropriate action. This might serve as a foundation to advocate for particular groups, leading to the concept becoming generalised. Based on past research, three actions were suggested to obtain agility: the first is a

comprehensive list of change areas, the second is a broad list of standard and inclusive changes as sub-items of the primary areas that organisations face and the third is how change may influence the firm (Sharifi & Zhang, 1999).

Implementing agility in an organisation entails changes in markets, competition, customer needs, technologies, and social variables (Teece et al., 2016). The capacities of an agile organisation to adapt correctly to these changes in its business environment are classified into four broad categories: responsiveness, competence, flexibility and speed.

Responsiveness is the capacity to recognise changes and respond quickly to them, either reactively or proactively, as well as recover from possible consequences that might have harmed or disrupted the business environment. Organisations may do this by sensing, perceiving and predicting changes, responding promptly by incorporating them into the system (Teece et al., 2016).

Competency is a broad collection of talents contributing to the productivity, efficiency and effectiveness of actions undertaken by a company directed towards its objectives and goals. Organisations must have a strategic vision, proper technology or adequate technological skill, higher product/service quality, improved cost-effectiveness and offer new goods to achieve this (Sharifi & Zhang, 1999). Organisations should also explore a management transformation, ensuring their staff is aware, competent, and empowered, ensuring operational efficiency and effectiveness through collaboration and integration (Ding et al., 2012).

Flexibility is described as the capacity to process miscellaneous goods and achieve different goals with the same facilities (Sharifi & Zhang, 1999). Organisations may do this by improving the flexibility of their product volume, configuration, personnel and organisational challenges.

Speed, or “quickness”, is the capacity to complete activities and procedures in the smallest amount of time. To reach speed, organisations must improve the time to market for new items and ensure quick operations (Sharifi & Zhang, 1999).

## **2.2. Adaptability**

Unexpected circumstances and quick changes frequently catch organisations off guard. Natural catastrophes, such as pandemics, destabilise supply chains, shock the public and paralyse financial markets have tremendous ecological and economic implications, echoing across supply networks, from raw materials to transportation (Linnenluecke, 2017). Economic and environmental regulations, such as the ban on the sale of vehicles with internal combustion

engines (new petrol and diesel cars) in Europe by 2035, place organisations in a situation where they must adapt while surviving and growing in today's global economic climate.

Thus, many scholars have raised an essential issue: what makes some organisations more effective in coping with and responding to the unfamiliar (Linnenluecke, 2017)? Adaptability is the solution to that question.

Likewise, adaptability is the dynamic ability of social agents to affect and unfold different evolutionary pathways through loose and weak connections while improving the system's overall responsiveness to unanticipated changes (Pike et al., 2010). Gordon and DiTomaso (1992), argue that adaptability is essential for superior organisational success. It can be seen as a distinct type of agility, for it does not require a sense of urgency to deal with unforeseeable futures.

Adaptability may be achieved through a variety of organisational and technological techniques. Several adaptability elements were identified in past studies, allowing organisational structures to be adjusted. To keep their competitive advantage or market niche position, these companies attempt to adapt their organisational structure in various ways by utilising one or more adaptability features (Katayama & Bennett, 1999).

So far, the approach of agility-focused organisations appears to have shifted their organisational structure toward adaptability. Non-agility-focused organisations, on the other hand, have lately realised the significance of this strategic orientation. As a result, the premise that organisations are attempting to improve their adaptability through agility improvement activities should be able to be established (Katayama & Bennett, 1999).

Hence, the emphasis has been on adaptability to change in the business environment and a proactive response to market and customer needs via newly evolved collaboration techniques (Sharifi & Zhang, 1999) to satisfy the requirements and prosper in the market.

According to research, organisations can demonstrate flexibility through two types of reactions – they can absorb the effect of a rapid environmental change via resilience or retain new practices and configurations through retention. According to the research, an organisation's culture and resources promote resilience, but organisational structures control ideology and shape retention (Linnenluecke, 2017).

In addition, many scholars have contributed to the literature by studying how organisations respond to external challenges and how this initiates organisational processes that can result in either a functional or ineffective response, determining an organisation's strategic placement and survival. However, the contradictions between the assertions, as mentioned earlier, and several other significant concerns remain unresolved, including an assessment of

whether and how organisations may mitigate the risks and develop resilience in the face of adversities, as well as how resilience can be produced at the individual, group, and organisational levels (Linnenluecke, 2017).

Research on the adaptability of business models has focused on understanding how organisations change, adapt and reinvent their business models in a constantly changing environment, ideally before external circumstances compel them to do so (Sharifi & Zhang, 1999). If correctly implemented, these organisational processes may result in either a functional or dysfunctional reaction to unfavourable external changes, enabling firms to be resilient.

Adaptability practices are designed to improve long-term performance (Gibson & Birkinshaw, 2004). According to research, business units can accomplish alignment and adaptability at the same time (Gibson & Birkinshaw, 2004). By organising themselves around adaptability, successful business units may build both skills at the same time. The focus here is on adaptability and the organisation's extraordinary ability to "turn on a dime". According to the literature, this capacity can be attained by "hiring intelligent people," setting aggressive but not unreasonable goals and avoiding excessive formalisation.

Consequently, alignment may be established by defined objectives, goal-setting procedures, and reward systems that encourage adaptation. To guarantee adaptability, organisations must ensure that their strategy is consistent and that employees understand their mission. When adaptability is used, business units require discipline, support, trust and time to perform (Gibson & Birkinshaw, 2004).

## **2.3 Findings**

Companies in different sectors adapt to change differently by assessing strategic capabilities that are appropriate for their circumstances (Teece et al., 2016). According to Teece et al. (1997), it is critical to determine which frameworks are suited for each situation. Firms with high dynamic skills can better perceive new advances because they are better at recognising, seizing and exploiting opportunities (Teece et al., 1997).

The first problem in managing business operations that compete in volatile contexts is determining whether the change source is predominantly risk or uncertainty. Uncertainty shows itself in the corporate environment as unexpected turbulence, upheaval, and hyper-competition; where interdependence and innovation are key critical factors (Teece et al., 2016). Risk and uncertainty can, and should, be managed differently.



Nevertheless, not all business environments have strong dynamic competition, which creates significant uncertainty. To effectively deal with significant uncertainty, businesses must quickly develop a hypothesis about what is happening in the business environment (Teece et al., 2016).

Strong dynamic capabilities can enable organisational agility while decreasing the cost of achieving a particular level of agility, allowing management to strike a more favourable balance between agility and efficiency (Teece et al., 2016).

Also, agility should be sought only when it is compatible with the needs of the business environment and the firm's strategy. Agility is often unnecessary in corporate settings where risk is the only concern (Teece et al., 1997).

Organisational and human resource practices are becoming more effective and vital (Teece et al., 2016). Managers who want to establish and sustain agility in their organisations should do so based on their market strategy, positioning and their willingness to prepare for both the downside and upside (Teece et al., 1997).

## **2.4 Expressing Adaptability**

Based on prior studies, it is clear that several factors influence an organisation's level of adaptability. To properly understand what aspects must be investigated and then analysed to evaluate if adaptability is being attained, it is necessary to study this issue from the firm's viewpoint and its management.

Previous research, such as that conducted by De Cremer et al. (2009), has shown how important it is to understand the why and when of self-sacrificial leaders motivating employees to express organisational citizenship behaviour. Recent research has recommended self-sacrificial leadership as a necessary antecedent to follower prosocial conduct in companies, in keeping with the idea that leaders are major influencers of organisational citizenship behaviour (De Cremer et al., 2009). Organizational success often depends on individuals' activities beyond the scope of their official duties; therefore, it's crucial that businesses find methods to encourage their employees to do good in settings where it's not required (Linnenluecke, 2017; Gibson & Birkinshaw, 2004). In order to ensure that the required circumstances are fulfilled in order to attain adaptability, it is proposed that leadership, especially self-sacrificial leadership, plays a significant role in inspiring people to engage in organisational citizenship behaviour (De Cremer et al., 2009). Older employees should lead by example, inspiring younger workers to make positive changes.

Additionally, intrinsic motivation, which measures the extent to which employees already exhibit a distinctive pattern of creative and motivational behaviour, is another crucial factor to consider. Individual creativity is driven by intrinsic motivation and serves as the foundation of organisational innovation, according to Tierney et al.'s studies on the issue. It has been argued that leadership is used to provide individuals with the challenge of innovation and transformation (Tierney et al., 1999). These authors discovered that employees' creative output is better when they work with supervisors that have a similar intrinsic motivational orientation. These results provide a better understanding of how adaptability may be accomplished by using employees' contributions to innovation.

Previous research by De Clercq et al. (2017) and Janssen (2001), has shown the significance of knowing what could disrupt creative and innovative behaviour, which is critical to developing adaptability and understanding how it can be used productively in the workplace.

Besides, according to Teece (2007), managers should take advantage of jobs and environmental settings that produce creative outputs when attempting to boost employee creativity. Employees are forced to refresh their knowledge base in order to establish a strong learning attitude as a result of this organisational exercise. Thus, organisations with strong creative goals might benefit from exposing workers to creative leader role models who express the satisfaction they get from their personal, continual learning efforts and contributions to changing organisational objectives (O'Reilly III & Tushman, 2008).

Some authors propose that employees' level of education and learning ability can be critical for enhancing job performance, especially innovative performance (Janssen, 2001). Based on previous findings from De Clercq et al. (2017), employees who value learning are more likely to find a way to turn challenging circumstances into opportunities for innovation because they get more joy from using what they have learned to resolve conflicts. Janssen (2001) also makes an interesting point regarding the creative behaviour of employees, that higher levels of education often lead to better outcomes in the workplace, especially in terms of creative output.

As a result, these authors argue that an individual with a high learning orientation or an individual with a higher level of education is better able to integrate different points of view and is more likely to be motivated to come up with original solutions to organisational difficulties (De Clercq et al., 2017), allowing the organisation to be better adapt in the face of change.

Problem-focused voice behaviour is the measure of prohibitive voice, representing the likelihood of employees speaking up about organisational problem areas. This behaviour, which

has been identified as another factor that affects adaptability in the face of change in organisations, is a measure of prohibitive voice (Liang et al., 2012).

Regarding this element, Liang et al. (2012) feel that it is also possible to be impacted by the level of education held by the people working in an organisation. The authors included education level as a variable in their research because of its possible influence on the voice of workers. They suggest that with higher levels of education, employees may have more general thoughts to express, enabling a better communication system (Liang et al., 2012). This improved communication flow inside the organisations may give an edge when compared with competitors when it comes to reacting to change.

It is generally agreed that workers' affective commitment is a component that impacts and influences change within an organisation and modulates its adaptability (Doz & Kosonen, 2010). Affective commitment, characterised by the portrayal of employees' emotional connection toward their firm, may be utilised to create adherence to innovation and adaptability in the workplace (Meyer & Allen, 1991).

Researchers have discovered that performance is positively correlated with job satisfaction, affective commitment, and work happiness (Linnenluecke, 2017). As a result, other academics decided to conduct additional studies on the connection between affective commitment and how it affects long-term commitment or job tenure. Meyer and Allen (1991) argue that workers with a high emotional connection to their organisation are more likely to stay with it because they want to. They think that workers want to stay in companies that provide excellent work experiences because they place a high value on such experiences and anticipate that these experiences will continue. (Meyer & Allen, 1991).

As per the authors, increasing efforts to create high affective commitment might improve the achievement of organisational objectives and better flexibility in the face of change (Meyer & Allen, 1991).

## **Chapter 2 – Adaptability in different sectors**

### **1. Introduction**

As previously explored, market leadership in today's business climate can no longer be assumed. Profitability and market share used to go hand in hand but, in recent years, that correlation has weakened significantly. As a result, it has become increasingly difficult for some executives to pinpoint their competitors' industries and specific companies. Since conventional

approaches to strategy are based on the assumption that the environment is relatively stable and predictable, formulating a plan becomes exceedingly challenging, when facing uncertainty (Reeves & Deimler, 2011).

More, Reeves and Daimler (2011), believe this challenge is felt because conventional strategic thinking assumes a relatively static and orderly reality. In retrospect to previously analysed studies, it is clear that most strategies aim to provide the company with a sustainable edge in the market by either establishing a dominant market position or amassing the required set of talents and abilities (Hamal & Välikangas, 2003; Doz & Kosonen, 2010; O'Reilly III & Tushman, 2008; Teece et al., 2016).

As such, companies conduct periodic strategy reviews to establish direction and organisational structure based on an examination of their industry and projections of how it changes. However, given the current level of uncertainty, many businesses are beginning to have many concerns.

These businesses' responses are consistent and no longer suggest a long-term competitive advantage from market dominance, size, or even first-order expertise in producing or delivering products. Everything about them is fixed. Insightful managers have found that this trait emerges from the institutionalisation of responses to external challenges that foster rapid adaptation. Companies should not specialise in being experts but instead be adept at quickly picking up new skills (O'Reilly III & Tushman, 2008). Successful people and organisations constantly scan the environment for signs of a shift, act on them and master the art of rapid, cheap experimentation (O'Reilly III & Tushman, 2008).

This ability encompasses not just the final product but also the business's models, procedures, and overall approach to the market. These adaptable corporations have honed their skills in managing intricate multisectoral systems in a globally interconnected business environment (Sharifi & Zhang, 1999).

Correspondingly, a company must consider the external environment if it wants to adapt (Teece, 2007). A company can modify or rethink its business model after deciphering these signals, which has the potential to alter the industry's information ecosystem (Reeves & Deimler, 2011).

In a world where change can undoubtedly be perceived earlier by one player in the market than another, businesses must rely more on advanced systems to guarantee they capture all the data needed. The anticipation of this phenomenon can determine who becomes the market leader and who gets to be the follower.

The following four questions were made to assess the role of forecasting and planning and how they should be apprehended when faced with today's uncertain world.

Q1. How can standard forecasting and analysis be employed in a business when the environment is increasingly uncertain?

To avoid limiting themselves to standard forecasting and analysis, organisations can conduct experiments using unorthodox forecasting methodologies. It is not uncommon for experimental results to reveal information that cannot be deduced or predicted. Undoubtedly, all businesses experiment when creating and evaluating new products and services (O'Reilly III & Tushman, 2008).

Conventional forecasting and analysis methods can be damaging to the business. In order to apply new strategies to crush current difficulties, businesses must alter their experimental methods and increase the breadth of their testing (Doz & Kosonen, 2010).

Products and services have always been front and centre. However, even the most well-thought-out business plans, strategies and practices can become irrelevant overnight in today's ever-changing landscape. Therefore, compared to their competitors, adaptive businesses experiment in many more ways (Hamal & Välikangas, 2003).

Q2. How can a firm comprehend and predict change before it is struck with shifting information?

Cross-organisational economic activity, outsourcing, and value networks highlight the fact that companies must develop internal and external business strategies (O'Reilly III & Tushman, 2008). Instead of a small number of firms producing equivalent goods, services and interacting with one another and their supply chain on a regular and distant basis, modern industries are more accurately described as competing webs or ecosystems of interdependent firms (Ding et al., 2012). Successful companies in such an environment develop strategies at the network level (Sharifi & Zhang, 1999).

In order to keep their ecosystems running smoothly, adaptive businesses typically foster confidence among their members. The Kanban and Kaizen feedback mechanisms used in Toyota's global automobile supply chain are early examples of adaptability systems. Late entrants in the automotive industry, like in the case of Tesla, quickly rose to the top of their industry by pooling the resources of numerous entities.

Q3. What frameworks can organisations use, based on scale or position to avoid losing market position in the face of change?

Adaptability is an ever-occurring state, and businesses must create environments that encourage people to share information, be proactive, take calculated risks and be open to change (Sharifi & Zhang, 1999).

In this sense, companies that can use their resources and tools to foster adaptability respond swiftly and proactively to environmental changes, developing more fluid organisational structures. The significant benefit of a rigid hierarchy is that everyone knows what they should do; this benefit is lost when decentralised, fluid organisational structures are created and compete for resources (Katayama & Bennett, 1999).

Organisations cannot have a successful adaptive organisational structure unless they are transparent with their employees about the parameters within which they can act and make decisions (Linnenluecke, 2017).

Q4. How can a planning cycle remain relevant in the face of fast change?

It can be especially challenging for well-established, large businesses to change their management methods, especially when they have worked well for a long time. Nonetheless, a few strategies can help well-established businesses maintain adaptability (Katayama & Bennett, 1999).

When looking at outsiders in constantly evolving industries, it is common to see new, innovative competitors emerge. Managers should focus on what the new players are doing to understand where the company can improve or what should be explored (Linnenluecke, 2017). Encouraging the management team to forego a simple business forecast in favour of an analysis of the potentially unknowns could significantly impact the company and convert the potential harmful “unknowns” into profitable and “knows”. This must involve long-term planning (Doz & Kosonen, 2010).

The majority of businesses have multiple strategic projects in the works. Developing a plan for each potential threat can lead the organisation towards adaptability. Organisations must address every significant uncertainty by exploring many potential solutions to gain insight into the root of the issue (Teece et al., 2016). The next step would be to generate several alternatives

to accompany every change proposal to each threat, fostering cognitive diversity and organisational flexibility (Sharifi & Zhang, 1999).

In today's fast-changing market, businesses must speed up the rate of change by finding ways to adjust speed based on the time it takes to make a decision (O'Reilly III & Tushman, 2008).

The answers to the previous questions highlight that adaptability is no silver bullet. Trying to acquire an edge in a solid, predictable industry may pay off if organisations stick with what has always worked. However, let us assume that, as in an increasing number of industries, the competitive reality is ambiguous and constantly evolving. Then, in order to be competitive, firms need to adopt a strategy that is both adaptable and long-term. Structuring a company with skills that offer what is termed an "adaptable edge" might be important to its continued existence.

## **2. Adaptability in the Automotive sector**

The introduction of the Ford Model T in 1908 revolutionised the motor industry and how people travelled (Witvoet, 2022). This development not only placed “the globe on wheels” but also ushered in a new era of mass manufacturing and suburban expansion that forever altered our way of life (Witvoet, 2022). Now, in the twenty-first century, the most extraordinary change in public transportation since the industrial revolution is taking place: the shift to electric vehicles (Witvoet, 2022).

When it comes to making the switch to electric cars, every automaker is rushing to meet the deadline set by the European Union (EU) to eliminate sales of new vehicles powered by internal combustion engines (ICE) by the year 2035 (Witvoet, 2022). Therefore, adaptability is essential for success.

However, many organisations in the car industry have fallen behind because they could not adapt to the market, whether it meant the entry of new rivals, a shift in customer tastes that affected demand, shifts in supply, or regulations from government bodies. Various research on mobility-related business models, innovation-related business models, sustainability-related business models and adaptability-related business models was produced to foresee potential future outcomes.

Companies are at the frontlines in the fight to reduce carbon emissions; therefore, understanding this sector is crucial. Research is needed to address and understand the fast

changes happening in global mobility and transportation, especially in light of the pressure on automotive companies to achieve the targets mandated by the EU.

It is no secret that the automotive industry is a significant consumer of the world's finite natural resources. Companies in the car industry are under increasing pressure from their stakeholders to assess and improve their adaptability and sustainability. Nowadays, organisations are more worried about the impact their businesses have on society and the environment, and they look to businesses to adopt sustainable practices conforming to the market's needs (Jasiński et al., 2021).

Governments encourage businesses to invest in social and environmental initiatives by enacting new legislation, pressuring the automotive industry to manage and improve sustainability performance. By placing liability on car manufacturers for the adverse effects attributed to vehicle use, policymakers hope to push the entire industry toward electrification (Jasiński et al., 2021).

As to gain an advantage over competitors that do not alter their business strategies, companies need to implement a tracking system and analyse the most significant internal and external effects. New business possibilities may be found; consumer loyalty and the company's image can be boosted; sustainable-minded niche markets can be exploited; and new laws and regulations can be anticipated and handled swiftly if necessary (Jasiński et al., 2021).

In order to encourage adaptability, businesses must shift toward sustainability. Companies need to experiment with novel ideas every once in a while. These ideas might be in the form of new products, technologies, industrial processes, institutional and structural systems, or business models (Jasiński et al., 2021).

The automobile industry can never advance if it holds on to its antiquated business methods. The entire sector is threatened for the first time in its long and distinguished history. Tesla, the new player, is seen as the new potential danger since he does not abide by the rules. The current disruptions in the sector should serve as a stark reminder of its vulnerability (Choudhary, 2020).

In order to survive in today's economy, the auto industry must adapt drastically. Even if the automakers are successful, the market may not be receptive to them. All the obstacles that this change requires must be overcome through adaptability before the status quo may be altered (Choudhary, 2020).



**Part B - Empirical Study**

## **Chapter 3 - Methodology**

The purpose of this chapter is to describe the methodology used in the empirical study. The study results were described, including the hypotheses formulated and the instruments used, as well as the methods of collection and sampling.

### **1. Objectives, research questions and hypotheses**

Numerous companies in the automotive sector have failed to adapt to market changes, whether those changes are due to new competitors, a shift in consumer preferences affecting demand, variations in supply, or government-related changes, as in the case of this study. Various studies related to business models for mobility, innovation and sustainability analysis were developed to propose possible future scenarios.

The importance of studying this sector is that, for these policies to be effective in changing carbon emissions in Europe, the first step needs to be taken by companies, as they are the first line in this battle. This rapid change occurring in the world's mobility and transportation, coupled with the urge for companies in the automotive sector to meet the required goals set by the European Union, represents a research gap that needs to be addressed and researched.

In this project, the intention was to study how automotive sector companies can adapt and innovate to meet these incoming challenges brought by EU policies. The objective of this study is to analyse the relationship between organizational citizenship behaviour, intrinsic motivation, creative behaviour, problem-focused voice behaviour and affective commitment constructs and demographic variables such as age, level of education and job tenure.

Through this objective, an evaluation, of how companies in the automotive sector react, adapt and innovate to provide answers to these incoming challenges, was conducted. This objective also allowed to learn the differences between adaptability and agility and to determine whether or not there is a connection between innovation and adaptability to the market's changing needs and demands.

Based on the bibliography consulted and to achieve the proposed objectives, the purpose of this project is to draw broad conclusions about the automotive sector using the data obtained from the questionnaire. With this background in mind, and since no studies were found that examined the relationship or differences between these constructs, organisational citizenship behaviour and intrinsic motivation, in terms of age, two research questions were formulated:

RQ1: Are there differences in the level of organisational citizenship behaviour of employees according to their age?

RQ2: Are there differences in the level of intrinsic motivation of employees according to their age?

In light of what has been stated, and based on the literature, the hypotheses that can be tested are as follows:

H1: Employees with a higher level of education have a higher level of creative behaviour.

H2: Employees with the highest level of education are more vocal about organisational problem areas.

H3: Employees with longer job tenure have higher levels of affective commitment.

The goal of the three hypotheses and the two research questions is to draw some inferences from the gathered data in order to provide some answers to the questions that arose as a result of the research. The findings are informative, and the aim is to use the examples analysed in the questionnaire to draw more generalised conclusions about the overall situation brought about by the uncertainty connected to the ban on the sale of ICE vehicles in Europe from 2035 onward. The structure of the rest of the paper is comprised of the data analysis, the results, the conclusions and the limitations.

## 2. Sample

From the questionnaire, 64 people completed it, among whom 43 (67.2%) of the respondents were men and 21 (32.8%) were women. The average age of the sample is between 40 and 49 years old (n = 22); in tables 1 through 5 (tables 14 and 15 in the annexe), the sample from the sociodemographic questionnaire can be observed.

*Table 1: Descriptive statistics regarding gender*

	<b>Gender</b>	
<b>Total</b>	64	1
<b>Men</b>	43	67.2%
<b>Women</b>	21	32.8%

In regards to the age of the sample, the largest age group is 50 years of age or older, representing 35.9% (n = 23) of the sample population. Almost half 42.2% (n =27) of the

population sample have as highest level of education the Bachelor's degree, followed by Master's or higher 23.4% (n =15).

*Table 2: Descriptive statistics regarding age*

<b>Age</b>		
<b>TOTAL</b>	64	1
<b>20–29</b>	11	17.2%
<b>30–39</b>	8	12.5%
<b>40–49</b>	22	34.4%
<b>50+</b>	23	35.9%

*Table 3: Descriptive statistics regarding the highest level of education*

<b>Highest Level of Education</b>		
<b>TOTAL</b>	64	1
<b>Secondary/Basic</b>	12	18.8%
<b>Post-secondary (professional, technical, etc.)</b>	10	15.6%
<b>Bachelor's</b>	27	42.2%
<b>Master's or Higher</b>	15	23.4%

More than half, 50.8% (n = 32), of the participants in the questionnaire's current functional area is sales or marketing. Research and development is the functional area where the sample population is least represented (1.6%, n = 1). The hierarchical level groups with the most representation in this sample are senior, with 32.8% (n = 21) of the sample population, and director, with 31.3% (n = 20) of the sample population.

*Table 4: Descriptive statistics regarding the current functional area*

<b>Current Functional Area</b>		
<b>TOTAL</b>	63	1
<b>Sales/Marketing</b>	32	50.8%
<b>Operations/Technical</b>	13	20.6%
<b>Research &amp; Development</b>	1	1.6%
<b>Financial/Administrative/Accounting/Human Resources</b>	14	22.2%
<b>Information Systems</b>	3	4.8%

Table 5: Descriptive statistics regarding the hierarchical level

Hierarchical Level		
<b>TOTAL</b>	64	1
<b>Junior</b>	7	10.9%
<b>Senior</b>	21	32.8%
<b>Principal</b>	7	10.9%
<b>Director</b>	20	31.3%
<b>Partner</b>	9	14.1%

When taking a closer look at some of these sociodemographic variables (tables 6 to 9 and figures 1 to 4) of the respondents aged between 40 and 49 years old, 19 (29.7%) are men and 3 (4.7%) are women. Regarding employees' hierarchical level and its highest levels of education, it can be seen that 31.3% of the sample population are directors, and out of these 20, only 6 (9.4%) have a master's degree or higher education.

Table 6: Descriptive statistics regarding age by gender

	20–29 (n,%)	30–39 (n,%)	40–49 (n,%)	50+ (n,%)
<b>TOTAL</b>	11 (17.2%)	8 (12.5%)	22 (34.4%)	23 (35.9%)
<b>Women</b>	2 (3.1%)	5 (7.8%)	3 (4.7%)	11 (17.2%)
<b>Men</b>	9 (14.1%)	3 (4.7%)	19 (29.7%)	12 (18.8%)

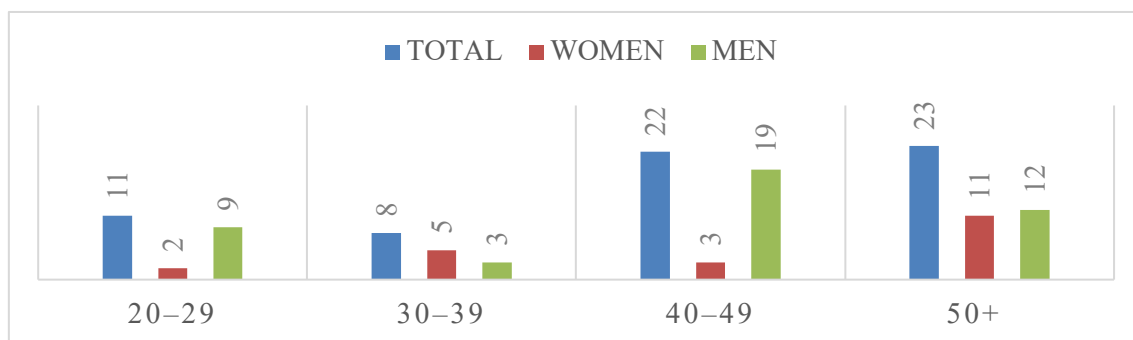


Figure 1: Age and Gender

Table 7: Descriptive statistics regarding hierarchical level by the highest level of education

	Partner (n,%)	Director (n,%)	Principal (n,%)	Senior (n,%)	Junior (n,%)
<b>TOTAL</b>	9 (14.1%)	20 (31.3%)	7 (10.9%)	21 (32.8%)	7 (10.9%)
<b>Secondary/Basic</b>	1 (1.6%)	1 (1.6%)	3 (4.7%)	7 (10.9%)	0 (0.0%)
<b>Post-secondary (professional, technical, etc.)</b>	1 (1.6%)	2 (3.1%)	2 (3.1%)	4 (6.3%)	1 (1.6%)
<b>Bachelor's</b>	2 (3.1%)	11 (17.2%)	1 (1.6%)	8 (12.5%)	5 (7.8%)
<b>Master's or Higher</b>	5 (7.8%)	6 (9.4%)	1 (1.6%)	2 (3.1%)	1 (1.6%)

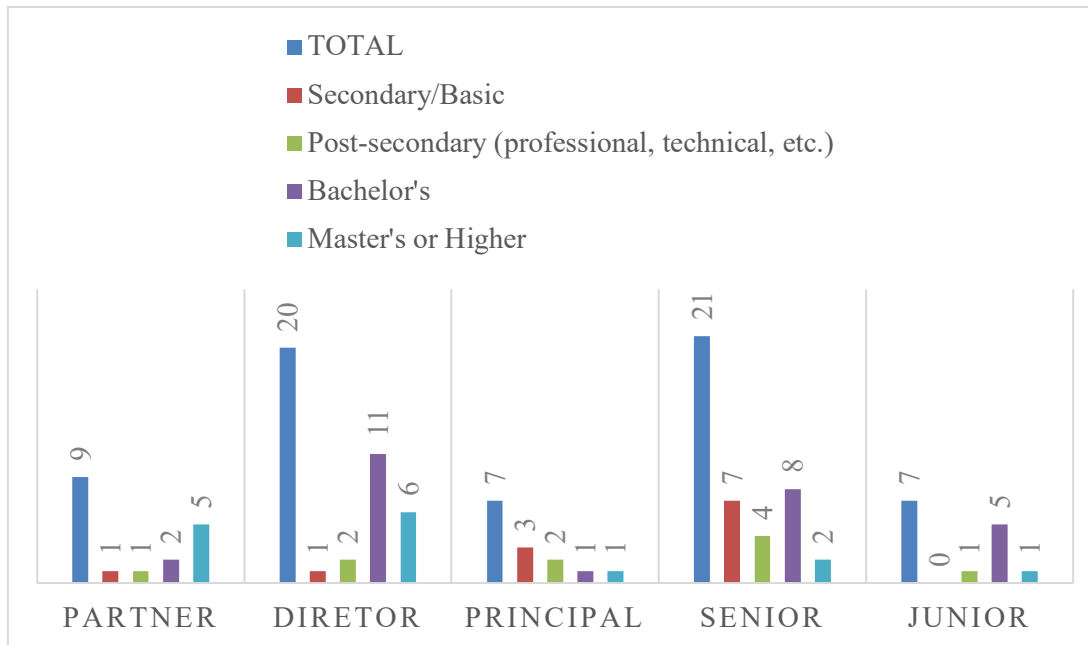


Figure 2: Hierarchical level and its highest level of education

With respect to employees' hierarchical level and age, it can be observed that of the 64 respondents, 20 (31.3%) are directors, and out of these, 12 (18.8%) are over 50 years old. There are no directors younger than 30 years old, 10.9% (n = 7) of the sample population is junior, and none of them is older than 39 years old. More than half of seniors are aged between 40 and 49 years old (12 out of 21 seniors). It can also be seen that more than half of the respondents work in sales or marketing (50.8%), and out of those 32 people, 12 have been working in the same position for less than 5 years. A majority of those polled, 58.7% (n = 37), have only worked in their current position for less than 11 years.

Table 8: Descriptive statistics regarding hierarchical level by age

	Partner (n,%)	Director (n,%)	Principal (n,%)	Senior (n,%)	Junior (n,%)
<b>TOTAL</b>	9 (14.1%)	20 (31.3%)	7 (10.9%)	21 (32.8%)	7 (10.9%)
<b>20–29</b>	1 (1.6%)	0 (0.0%)	2 (3.1%)	2 (3.1%)	6 (9.4%)
<b>30–39</b>	2 (3.1%)	2 (3.1%)	0 (0.0%)	3 (4.7%)	1 (1.6%)
<b>40–49</b>	2 (3.1%)	6 (9.4%)	2 (3.1%)	12 (18.8%)	0 (0.0%)
<b>50+</b>	4 (6.3%)	12 (18.8%)	3 (4.7%)	4 (6.3%)	0 (0.0%)

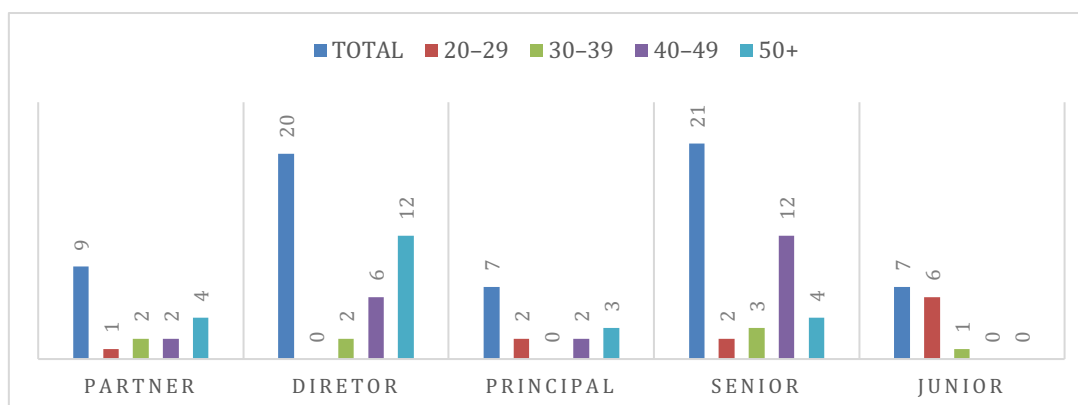


Figure 3: Hierarchical level and age

Table 9: Descriptive statistics regarding position tenure by current functional area

	0–5 (n,%)	6–10 (n,%)	11–15 (n,%)	16–20 (n,%)	more than 20 (n,%)
<b>TOTAL</b>	28 (44.4%)	9 (14.3%)	10 (15.9%)	8 (12.7%)	8 (12.7%)
<b>Sales/Marketing</b>	12 (19.0%)	6 (9.5%)	5 (7.9%)	5 (7.9%)	4 (6.3%)
<b>Operations/ Technical</b>	9 (14.3%)	1 (1.6%)	2 (3.2%)	0 (0.0%)	1 (1.6%)
<b>Research &amp; Development</b>	1 (1.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
<b>Financial/ Administrative/ Accounting/Human Resources</b>	4 (6.3%)	1 (1.6%)	3 (4.8%)	3 (4.8%)	3 (4.8%)
<b>Information Systems</b>	2 (3.2%)	1 (1.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

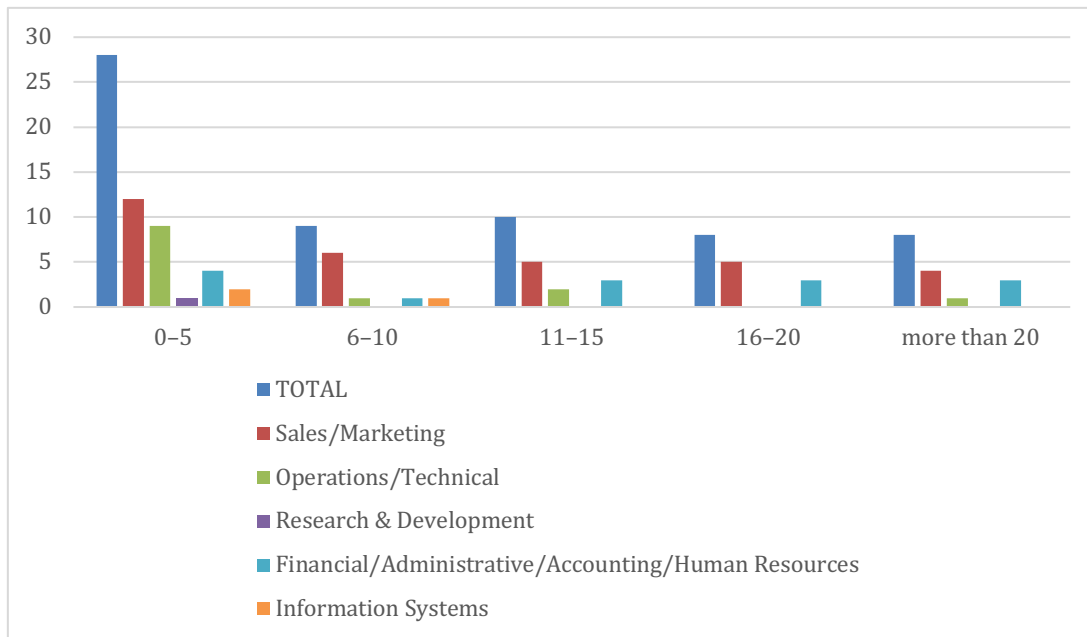


Figure 4: Current functional area and position tenure

### 3. Instruments

Data was collected using an organisational questionnaire, which aims to evaluate organisational factors, employee behaviours, individual factors and other organisational factors.

An organisational survey is a straightforward and cost-effective method for understanding and measuring the perceptions that employees working for an organisation hold, as well as how those perceptions may influence the behaviours of those workers. In addition, it evaluates the performance of the organisation and its culture, assisting in identifying its strengths, opportunities, gaps and needs. Organisational surveys are another method for determining the elements contributing to employee engagement. These characteristics include leadership, cooperation, organisational support and culture.

The survey for this demographic was created using verified constructs from the literature and consisted of 100 questions organised into eighteen constructs. A bilingual translator used a translation-back-translation procedure to translate the original English version into Portuguese, which was then back-translated into English by another bilingual translator (Brislin, 1986).

For the survey, based on prior research, the focal constructs were measured with previously validated seven-point Likert anchors, ranging from “completely disagree” (1) to “completely agree” (7). Based on the analysis of the literature in the literature review, five of the eighteen constructs were chosen to be the focus of this study.



*Organisational citizenship behaviour.* The extent to which employees undertake voluntary work efforts with a four-item OCB scale was captured (De Cremer et al., 2009). Some of the statements employees agreed with include, “I take actions to protect the organisation from potential problems” and “I develop skills and knowledge that are beneficial to my organisation” (Cronbach’s  $\alpha = 0.71$ ). Our reliance on this self-rated measure is consistent with the argument that other responders (e.g., peers and supervisors) have only a partial view of the range of voluntary activities employees undertake during work.

*Intrinsic Motivation.* A five-item scale was used to evaluate staff members’ intrinsic motivation (Tierney et al., 1999). Notably, workers were asked to rate how much they agreed with statements like “I enjoy engaging in analytical thinking.” and “I enjoy improving existing processes or products.” (Cronbach’s  $\alpha = 0.93$ ).

*Creative behaviour.* Employee creativity was measured using a nine-item scale validated by prior research (De Clercq et al., 2017; Janssen, 2001). This scale focuses on employees’ ability to generate new ideas for organisational improvement rather than on employees’ willingness to champion or implement those ideas (Janssen, 2001). Participants rated, for example, whether “I often have new ideas that improve the organisation” and “I often turn innovative ideas into useful applications” (Cronbach’s  $\alpha = 0.94$ ). Since other members of an organisation, such as peers, hardly ever have a comprehensive perspective on the breadth of creative behaviours that a person engages in, self-assessment tools for measuring creativity are common and might be better in some cases.

*Problem-focused voice behaviour.* Using a five-item measure of prohibitive voice, the likelihood of employees speaking up about organisational problem areas was determined (Liang et al., 2012). Thus, they expressed their agreement with whether “I dare to voice opinions on things that might affect efficiency in my organisation, even if that would embarrass others” and “I proactively report problems that have occurred in the organisation to my manager” for example (Cronbach’s  $\alpha = 0.82$ ). This is consistent with earlier research and the claim that employees can better identify personal setbacks within their work domain, assess their actual impact and identify options for taking action (Linnenluecke, 2017). The focus on self-assessments of voice behaviour is consistent with this claim.

*Affective commitment.* The emotional connection workers feel toward their company was evaluated using a six-item scale derived from earlier studies (Meyer & Allen, 1991). The participants rated whether “I have a strong sense of belonging to this organisation.” and “I feel emotionally attached to this organisation.” (Cronbach’s  $\alpha = 0.95$ ).

## **Sociodemographic questionnaire**

A sociodemographic questionnaire was also used to obtain data on the demographic and professional characteristics of the participants. The following three were chosen based on the literature: employees' ages (0 = 20–29 years old, 1 = 30–39 years old, 2 = 40–49 years old, 3 = 50+ years old), employees' highest levels of education (0 = Secondary/Basic, 1 = Post-secondary (professional, technical, etc.), 2 = Bachelor's, 3 = Master's or Higher), and employees' job tenure (0 = 0–5 years, 1 = 6–10 years, 2 = 11–15 years, 3 = 16–20 years, 4 = more than 20 years).

### **4. Data collection procedures**

Data collection was done with a questionnaire. This questionnaire was distributed in June 2022 among the employees of several Portuguese companies competing in the automotive sector. Among these companies that provide various services, some focus on wholesaling, others on retailing, and others on vehicle maintenance.

This organisational questionnaire enabled an understanding of its adaptability to the market changes occurring. For this purpose, the companies in the questionnaire represent the sector. This data collection method was intended to reduce the influence of hidden factors that can affect the company's internal culture or the level of external market competition, which could negatively influence the results.

The data collection process consisted of two rounds of an internet-based survey (using Microsoft forms), with a 1-week time lag between each round. The final version of this survey was given in Portuguese once a few minor issues were resolved. Microsoft Forms was used for online administration since it was a well-known and simple-to-use tool for the organisation's staff.

A number of guarantees about the participants' rights and safeguards were included in the survey, which was given out in Portuguese. Respondents were assured in the introduction that their answers would be kept strictly secret. It was clear that, for this research, the only interest was in looking for broad data trends and not analysing specific instances. The participants were also assured that they could quit at any moment and that there was no "right" or "wrong" response. Furthermore, the survey's opening stressed the importance of participants' honest replies, even though a wide range of answers was anticipated. In this way, there is less chance of social desirability bias and acquiescence bias influencing the decision-

making process (Jordan & Troth, 2020). These criteria eliminate worries about conformity and social desirability bias.

## **5. Statistical procedures and sample characterisation**

The data was entered into a double-entry matrix created in the SPSS program for the questionnaire (Statistical Package for the Social Sciences, version 26). Each line corresponded to a participant, and each column to one question.

To begin with, some variables had to be recoded, because some items did not have significant results, so the recoding allowed a better analysis of the comparison of these results with the constructs.

The variable “What is your age?” was recoded, this recoding grouped the results of “50-59 years old” and “60-69 years old” into a single group, “50 + years”. The variable was left with only 4 categories ( “20–29 years old”, “30–39 years old”, “40–49 years old”, and “50+ years old”).

“What is your highest level of education?” was also recoded because this variable had few results in one item. The results of “Master’s/Postgraduate” and “Doctorate” were combined into a single group called “Master’s or Higher”.

The descriptive analysis of the quantitative variables consisted of analysing the mean, median, minimum, maximum, standard deviation and interquartile range. For the qualitative variables, frequencies and percentages were analysed.

Regarding the normality of the quantitative variables, an assumption for using parametric statistics was examined using the skewness and kurtosis values, results of Kolmogorov-Smirnov and Shapiro-Wilk tests, and plots. Most variables did not present a normal distribution; therefore, parametric and non-parametric tests were carried out. Since the obtained results were the same, the results of the parametric tests were reported, as suggested by Fife-Schaw (2006).

ANOVA was used to compare three or more groups regarding quantitative variables. The homogeneity of variances was examined using Levene's test. When homogeneity of variances was not met, Brown-Forsythe's test was used.

When significant differences were found, post hoc tests were used, namely the Games-Howell test, since the homogeneity of variances could not be verified.

## Chapter 4 - Presentation and discussion of results

This chapter demonstrates and explains the results. The statistical analysis for the results of this questionnaire was divided into two parts: the first was descriptive, characterising each of the variables thoroughly and allowing us to obtain an overall view of the sample responses. The second part consisted of a comparative analysis of the data.

### 1. Descriptive analysis

The objective of the descriptive analysis was to characterise the various variables based on the frequency of their respective categories, in an effort to find the categories with particularly low or high values. In addition to the mean and standard deviation, each variable's results were analysed using the mean and standard deviation.

To begin with, the average score on organisational citizenship behaviour was 6.09 (SD = 0.82). 73.4% (n = 47) of respondents rated between "6" and "7" in the statement "I take actions to protect the organisation from potential problems.", 79.7% (n = 51) of respondents also ranked between "6" and "7", in the statement "I have a cooperative relationship with both my boss and my colleagues.". 80.6% (n = 50) also rated between "6" and "7" when responding to the item "If necessary, I am prepared to work overtime.". Almost the same amount of participants, 81.0% (n = 51) rated between "6" and "7" in the item "I develop skills and knowledge that are beneficial to my organisation.".

In the questions about *Intrinsic Motivation*, the average score was 5.70 (SD = 1.01). 70.3% (n = 45) of respondents rated between "6 - 7" in the question "I enjoy finding solutions to complex problems.". In questions such as "I enjoy improving existing processes or products." and "I enjoy coming up with new ideas for products." more than half of the participants rated "6" or more, 65.6% (n = 42) and 67.2% (n = 43), respectively. Most participants, 62.5% (n = 40), rated between "6 - 7" for this question, "I enjoy engaging in analytical thinking.", 59.4% (n = 38) rated between "6 - 7" for this question, "I enjoy creating new procedures for work tasks.".

In the responses to the questions regarding Creative Behaviour, the average score was 5.28 (SD = 1.05). More than half of the employees rated between "6 - 7" for the items "I often have new ideas that improve the organisation." and "I often look for new working methods, techniques, or tools.", 65.6% (n = 42) and 65.1% (n = 41) respectively. The same pattern was also found in the following questions "I often generate original solutions to problems." and "I

often mobilise support for innovative ideas.” 60.9% (n = 39) and 54.7% (n = 35), respectively.

On the other hand, in the same construct (Creative Behaviour), questions like “I often introduce innovative ideas into the work environment.”, only 32.8% (n = 21) rated between “6 - 7” for this question, while 40.6% (n = 26) of respondents rated “5” only somewhat agreeing with the statement. This scenario also happened with other items, such as “I often get approval for innovative ideas.” where 43.8% (n = 28) of respondents rated between “4 - 5” and only 42.2% (n = 27) rated between “6 - 7”. In the item “I often make important members of the organisation enthusiastic about innovative ideas.” 37.5% (n = 24) of participants rated between “6 - 7” and 45.3% (n = 29) rated between “4 - 5”. The question “I often turn innovative ideas into useful applications.” had as many respondents rating “5” and between “6 - 7” 35.9% (n = 23). Also with less than half 43.8% (n = 28) of the respondents rating between “6 - 7” was this question: “I often evaluate the usefulness of innovative ideas.”.

In the questions on Problem-focused Voice Behaviour, the mean of the registered scores was 5.76 (SD = 0.93). The majority of respondents ranked between “6 - 7” in all of the questions of this construct. In the items “I warn other colleagues about undesirable behaviours that harm professional performance” and “I speak up honestly about problems that might cause serious loss to my organisation, even when dissenting opinions exist” 64.1% (n = 41) and 62.5% (n = 40) ranked between “6 - 7” respectively. The same was observed for the items “I dare to voice opinions on things that might affect efficiency in my organisation, even if that would embarrass others”, and “I dare to point out problems when they occur, even if it makes it difficult for me to relate to other colleagues.” 60.3% (n = 38) and 66.7% (n = 42) rated between “6 - 7” respectively. In the item “I proactively report problems that have occurred in the organisation to my manager.” 65.6% (n = 42) of respondents rated between “6 - 7”.

Concerning Affective Commitment, analysing the responses, the average score was 5.41 (SD = 1.54). In all of the questions of this construct, more than half of the participants rated between “6 - 7” in questions such as “I truly feel the organisation’s problems as if they were my own.” and “I have a strong sense of belonging to this organisation.”, 54.7% (n = 35) and 65.6% (n = 42), respectively. In the item “I feel emotionally attached to this organisation.”, 67.2% (n = 43) of respondents rated between “6 - 7”., but there were some outliers, 7.8% (n = 5) completely disagreed “1” with the statement. In the items that followed, “I feel completely integrated with the people this organisation.” and “This organisation means a lot to me.” 66.7% (n = 42) and 67.2% (n = 43) of respondents rated between “6 - 7” respectively. In the final item of the construct “I would be very happy if I stayed the rest of my professional career in this

organisation.” 53.1% (n = 34) of respondents rated between “6 - 7”., but some outliers, 9.4% (n = 6) completely disagreed “1” with the statement.

*Table 10: Descriptive statistics regarding the studied constructs*

<b>Constructs</b>	<b>Mean</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Std. Deviation</b>	<b>Interquartile Range</b>
<b>Organisational citizenship behaviour</b>	6.09	6.25	4.25	7.00	0.82	1.25
<b>Creative behaviour</b>	5.28	5.33	2.22	7.00	1.05	1.33
<b>Intrinsic motivation</b>	5.71	6.00	1.00	7.00	1.01	1.20
<b>Affective commitment</b>	5.41	5.83	1.00	7.00	1.54	1.83
<b>Problem-focused voice behaviour</b>	5.76	6.00	3.20	7.00	0.93	1.45

## 2. Comparative Analysis

### 2.1. Comparison by age

The ANOVA test was performed with the new recoded variable, “How old are you? New”, with Organisational Citizenship Behaviour and Intrinsic Motivation (Table 11).

There are no significant differences in the organisational citizenship behaviour of employees based on their age,  $F(3,57) = 0.34$ ,  $p = 0.595$ . There are also no significant differences in the intrinsic motivation of employees based on their age,  $F(3,14.12) = 0.11$ ,  $p = 0.950$ .

Table 11: Differences in the constructs of organisational citizenship behaviour and intrinsic motivation according to age (ANOVA)

	Employees' Age				F	p
	20-29 years (n = 11) M (DP)	30-39 years (n = 8) M (DP)	40-49 years (n = 22) M (DP)	50 + years (n = 23) M (DP)		
<b>Organisational citizenship behaviour (total score)</b>	5.93 (0.87)	5.91 (1.10)	6.27 (0.72)	6.05 (0.79)	0.636	0.595
<b>Intrinsic Motivation (total score)</b>	5.76 (0.94)	5.55 (1.99)	5.81 (0.83)	5.64 (0.76)	0.114	0.950

## 2.2. Comparison according to the different educational levels

The ANOVA test was run with the newly recoded variable “What is your highest level of education?” and with Creative Behaviour and Problem-focused Voice Behaviour (Table 12).

There are no significant differences in the level of an employee’s Creative Behaviour based on their educational level,  $F(3,58) = 0.33$ ,  $p = 0.806$ . There are also no significant differences in the level of an employee’s problem-focused voice behaviour and its educational level,  $F(3,58) = 0.34$ ,  $p = 0.796$ .

Table 12: Differences in the construct’s creative behaviour and problem-focused voice behaviour according to the highest level of education (ANOVA)

	Employees' Highest Level of Education				F	p
	Secondary/Basic (n = 12) M (DP)	Post-secondary (professional, technical, etc.) (n = 10) M (DP)	Bachelor's Degree (n = 27) M (DP)	Master's/ Postgraduate or Higher (n = 15) M (DP)		
<b>Creative behaviour (total score)</b>	5.51 (0.62)	5.27 (1.09)	5.16 (1.24)	5.35 (0.95)	0.326	0.806
<b>Problem-focused voice behaviour (total score)</b>	5.90 (0.74)	5.94 (1.11)	5.72 (0.93)	5.61 (0.98)	0.341	0.796

### 2.3. Comparison depending on Organisational tenure measured in years

The variable “How long have you been working in this organisation?” was related to Affective Commitment, and an ANOVA test was performed (Table 13).

There are significant differences in the level of employees' affective commitment based on organisational tenure measured in years,  $F(4,58) = 3.39$ ,  $p = 0.015$ . The post hoc Test by Games-Howell reveals that employees who have been working in the organisation for more than 20 years have more affective commitment to the organisation than employees who have only been working in the organisation for less than 5 years ( $p = 0.008$ ).

Table 13: Differences in the construct affective commitment according to job tenure (ANOVA)

	Employees' Job Tenure					F	p
	0-5 years (n = 23) M (DP)	6-10 years (n = 5) M (DP)	11-15 years (n = 7) M (DP)	16-20 years (n = 11) M (DP)	more than 20 years (n = 17) M (DP)		
Affective commitment (total score)	4.58 (1.83)	6.13 (0.88)	5.69 (0.72)	5.53 (1.71)	6.13 (0.78)	3.394	0.015

## 4. Discussion

After performing statistical analyses on representative samples from the survey, this dissertation discusses its results in the context of the issues it sought to address. A link was made between the results and the literature evaluated for this study. The assumptions of this research are designed to aid in gaining a better understanding of the effects of adaptability and how it benefits businesses in the automotive sector.

Currently, organisations in the automotive sector are confronted with several issues that require innovation to overcome the challenges they are facing. Some organisational practices further solidify the idea that innovation is rare in businesses (Tamayo-Torres et al., 2006). By relating these poor practices to the explored constructs, the objective is to comprehend how the



analysed organisations address these challenges to guarantee that they are using adaptability to overcome them.

The factors affecting the organisation's ability to innovate and adapt can be determined by analysing the responses to the questionnaire constructs previously mentioned in the paper (organisational citizenship behaviour, creative behaviour, intrinsic motivation, affective commitment and problem-focused voice behaviour). Some factors that can affect the organisation's ability to innovate and adapt are unattainable expectations for innovation, teams without training, a lack of innovation strategies, a weak innovation culture, a lack of managerial support, resistance to change and a lack of internal and external cooperation (Miller & Friesen, 1982; Tamayo-Torres et al., 2006). Tool issues, disorganised organisation and inefficient operations are other factors that limit an organisation's capacity for innovation and adaptability (Ding et al., 2012; Teece et al., 1997).

The purpose of this study was to evaluate how companies in the automotive sector react, innovate and adapt to provide answers to these incoming challenges.

As previously analysed, more than half of respondents take actions to protect the organisation from potential problems, indicating that there is internal cooperation among workers. The respondents also denoted a cooperative relationship with their boss and co-workers, demonstrating that internal cooperation is robust among all company members (De Cremer et al., 2009). By analysing the results, it was also clear that the respondents demonstrated that they are prepared to work overtime if required, demonstrating the organisations' solid internal cooperation and culture (Sharifi & Zhang, 1999). The fact that most employees develop skills and knowledge that are beneficial to their organisation shows that there is training for the teams and a vital innovation and adaptability culture in the organisations studied (Teece, 2007). It also indicates that there does not seem to be much opposition to change as individuals strive to satisfy their organisations' innovation and adaptability requirements.

In the questions about Intrinsic Motivation, it was clear from the questionnaire results that most workers are receptive to change and embrace an innovation and adaptability culture to fulfil the organisation's strategies and goals. In questions such as "I enjoy improving existing processes or products." and "I enjoy coming up with new ideas for products." more than half of the participants rated "6" or more, proving once more that there is a powerful innovation and adaptability culture in these organisations. It can likewise be concluded that workers are enthusiastic about change and there is healthy internal cooperation in the organisations, as previously discussed by Tierney et al., (1999), that stated that when both employees and leaders are highly motivated by internal factors, innovation flourishes (Tierney et al., 1999). Most

participants like to engage in analytical reasoning and develop new procedures for work tasks, supporting previous findings on the understanding of the processes of adaptability (Pike et al., 2010).

In the responses to the questions regarding Creative Behaviour, more than half of the employees rated between “6 - 7” in regards to having new ideas that improve the organisation; looking for new methods, techniques, or tools; generating original solutions to problems; and mobilising support for innovative ideas, once again backing up previous findings (Tamayo-Torres et al., 2006), while also indicating that the studied organisations have well-defined innovation and adaptability strategies, and there is a strong culture pushing the willingness to change. The results found in the answers to this group of questions show a barrier between the boss and the employees. This justifies the difficulty in getting ideas approved, and it also indicates that there is a gap between having the idea and implementing it (De Clercq et al., 2017). This gap must be addressed and can be crucial in the pursuit of the company’s goals as it may weaken the internal cooperation within the organisation, create resistance to change, affect the innovation and adaptability culture, negatively impacting its strategies (De Clercq et al., 2017).

In the questions on Problem-focused Voice Behaviour, the results indicate good communication and cooperation between all parties in the organisation. There seems to be managerial support, but as has been seen before, there is a gap between managers and employees regarding innovation and translating ideas into actions (Liang et al., 2012; De Clercq et al., 2017).

With regards to Affective Commitment, all questions in this construct aim to understand if there is a sense of belonging within the organisation and whether the employees are integrated and feel a part of its culture (Meyer & Allen, 1991). In all the questions, more than half of the participants showed they have a strong perception of belonging in their organisation. However, there were also outliers, who completely disagreed when asked if they felt emotionally attached to their organisation and if they would be very happy if they stayed there for the rest of their professional careers. This can be alarmingly dangerous for organisations since it can limit internal and external cooperation and create resistance to change, ultimately affecting their adaptability (Teece, 2007; Meyer & Allen, 1991).

As there were no studies found that examined the relationship or differences between these constructs, organisational citizenship behaviour and intrinsic motivation, in terms of age, two research questions were formulated.

Regarding the first research question, the intention was to discover if there are differences in the level of organisational citizenship behaviour of employees according to their age. It was assumed that the older workers would have a higher organisational citizenship behaviour. This assumption was not confirmed in the present sample, and it was found that there are no differences in the level of organisational citizenship behaviour according to the age of employees.

With respect to the second research question, “Are there differences in the level of intrinsic motivation of employees according to their age?”, it was identified that there are no differences in the level of intrinsic motivation of employees according to their age. As previously mentioned, in the case of both of these constructs, there was no literature to support these questions.

As far as hypotheses are concerned, in the first one (H1), it was expected that employees with a higher level of education would have a higher level of creative behaviour. This hypothesis was not confirmed, for it was discovered that there are no differences in the level of creative behaviour of employees according to their level of education. However, based on previous findings from De Clercq et al. (2017), employees who value learning are more likely to find a way to turn challenging circumstances into opportunities for innovation because they get more joy from using what they have learned to resolve conflicts. As a result, an individual with a high learning orientation is better able to integrate different points of view and is more likely to be motivated to come up with original solutions to organisational difficulties (De Clercq et al., 2017).

As regards the second hypothesis (H2), it was expected that employees with the highest level of education would be more vocal about organisational problem areas. This hypothesis was not confirmed and goes against Liang et al.'s (2012) assumption, which stated that “employees with higher levels of education may have more ideas in general to voice” (Liang et al., 2012, p.80). Thus, in the present sample, there are no differences in the level of problem-focused voice behaviour according to the level of education of employees.

However, it is important to mention that most of the sample has very high educational levels, mostly Bachelor's degrees or higher (more than 65% of the sample population, as observed in table 3). This can suggest that perhaps no differences were found because the sample did not have much variability in educational level.

Lastly, the third and final hypothesis (H3), “Employees with longer job tenure have higher levels of affective commitment.”, was confirmed after it was discovered that there is a difference between the level of employees’ affective commitment and their job tenure. This

supports Meyer and Allen's (1991) research, which discovered that as affective and continuous commitment increased in strength, the likelihood of leaving the organisation diminished.

The same authors also found that affective commitment during the first year of work was strongly associated with confidence in the employer's choice, the significance of intrinsic variables in job choice, projected job satisfaction, and initial remuneration. Continuance commitment, dictating longer job tenure, was positively connected to the relevance of extrinsic variables in job selection and negatively related to expected job satisfaction and the number of job offers received. However, perceived difficulty in seeking a new job was the strongest predictor of continuance commitment. This finding, evaluated before admission, is substantially linked with employment retention after 1, 6, and 11 months (Meyer & Allen, 1991). This suggests that, for this dimension, younger employees have the least affective commitment to the organisations; therefore, the majority look for a new job within the first 11 months of being in an organisation.

## **Chapter 5 – Conclusions**

A few conclusions are presented after the analysis and discussion of the results. The findings from the survey support the underlying assumptions of the approach. This indicates that organisations are becoming aware of the value of adaptability but have not yet connected this idea to action.

The current study confirms that internal and external cooperative relationships exist in the organisations analysed (Sharifi & Zhang, 1999). A robust culture of innovation and adaptability was also found in these organisations (De Cremer et al., 2009). It was confirmed that most workers are receptive to change, embrace an innovation and adaptability culture to fulfil the organisation's strategies and goals (Teece, 2007). The studied organisations demonstrated well-defined innovation and adaptability strategies along with a strong willingness to change.

As highlighted above, the findings support the notion that there is a barrier between the boss and the employees. It was found that there are obstacles and constraints in getting ideas approved. This gap, between having the idea and implementing it, can be critical, for it may weaken the organisation, create resistance to change, and affect the innovation and adaptability culture of the company, negatively impacting its strategies (De Clercq et al., 2017).

Although results found that most employees have a strong affective commitment to their organisation, a few exceptions thoroughly contradict the norm. This may inhibit internal and

external cooperation and induce resistance to change, reducing organisations' adaptability (Meyer & Allen, 1991).

Regarding the hypotheses tested, differences were only observed in the construct of affective commitment according to the employee's job tenure, proving that employees with longer job tenure have higher levels of affective commitment. On the other hand, there were no significant differences in the constructs of creative behaviour and problem-focused voice behaviour according to educational level.

Furthermore, the findings also did not support the two research questions that suggested differences would have been found in the level of organisational citizenship behaviour of employees and the intrinsic motivation of employees according to their age.

### **Practical implications**

Adaptability is the dynamic ability to influence various evolutionary paths via weak social linkages, boosting the system's response to unforeseen changes (Pike et al., 2010). Alternatively, as Gibson & Birkinshaw (2004) similarly defined, it is the capacity to detect changes in the business environment and react to them by becoming adaptable and leveraging the core competencies of the company towards improving performance in the long-term. Any organisation needs to clearly understand its challenges and opportunities for growth and success.

This research raises valuable theoretical and methodological questions, including the importance of a culture of adaptability to a company's future success (Gordon & DiTomaso, 1992). From a methodological standpoint, the current study also points out the difficulties in predicting employees' performance and how it affects a company's ability to adapt. Even if a strong adaptability culture can influence employee performance and, consequently, the organisation's performance, external events can sharply affect corporate and sector results, such as a pandemic, war, policy change, or supply chain issues.

Further, different sectors of activity require different ways of facing challenges and adapting to change. In this study, for an industry undergoing significant time-bounded changes, achieving success demands a company to have higher levels of adaptability, whereas, in the face of an urgent change in the indefinite future, agility is more suitable. Nevertheless, the opposite may be true in industries where technologies, products, and policies undergo unexpected and quick changes.

The study results suggest beneficial implications for management practice. Managers must understand the situations in which adaptability is most advantageous, the degree of adaptability needed in each situation and the extent to which adaptability needs to be deliberate or conscious.

In addition, success entails the creation of innovative products and procedures and the adoption of novel organisational structures and business models, all pushed by a tenacious management team that relentlessly encourages organisations to meet their set objectives. Entrepreneurial managers must keep in mind that they have a significant influence on how an organisation develops in the future. To accomplish these goals and maintain an advantage over the competition, there must be a keen awareness of how the business environment is changing.

In order to simultaneously sustain current innovation and encourage creativity beyond existing competencies to avoid the issue of core rigidities, the development of new capabilities that depends on the composition of a capable organisational structure, culture, people, and processes, is essential (O'Reilly III & Tushman, 2008). One way for organisations to achieve these qualities is by enhancing knowledge creation. This study also found that the activities employees execute, as well as their job satisfaction, can positively or negatively shift the required level of adaptability necessary to meet the organisational goals.

A combination of constant learning and innovation - in the form of new goods, services, technology, or processes – makes superior performance a feasible target for any company. Applying these two traits will further enhance the company's skills best suited to be proactive and adapt to changes.

From this study, it is possible to assess that Portuguese companies in the automotive sector are being able to adapt to the profound changes that will occur by 2035. However, there is still much room for improvement and development as far as capabilities are concerned. Organisations must be nimble enough to respond quickly to new opportunities and challenges to thrive in today's fast-paced, ever-evolving business environment.

To summarise, the purpose of this study was to evaluate how companies in the automotive sector react, innovate and adapt to provide answers to the beforementioned incoming challenges. In this sense, the study discovered a link between innovation and adaptability, and realised that businesses in this sector must leverage these elements to capture the competitive gap left by the current and future changes in the automotive space. However, even though workers are receptive to accepting new concepts and challenges and adapting to unknown circumstances, managers impede this adaptability by erecting barriers to innovation. Thus, managers in the sector do not appear to know how to implement the right culture for

knowledge transfer across the entire organisation and have been, due to lack of knowledge, freedom to act and decide or even courage, unintentionally impeding the process of translating ideation to execution.

### **Limitations and future research**

The findings of this study's conclusions, when taken as a whole, are susceptible to a number of limitations. First, as the analysis is cross-industry, the uncovered relationships should be treated with some caution. Another limitation is that all measurements in this study are based on respondents' perceptions and, thus, are all subjective. As a result, they do not explicitly show how the variables relate to one another.

The lengthy questionnaire contained 100 questions, so there was a higher likelihood that respondents would start to get tired, which could have influenced the answers they provided. Therefore, fatigue is another factor that may have affected the questionnaire responses. Also, the questions were responded to in quantitative terms – seven-point Likert anchors, ranging from “completely disagree” (1) to “completely agree” (7) – which is subject to the perception and interpretation of the respondent to the scale.

The length of the questionnaire brought up another problem with this study: the number of responses to the questionnaire. More than 300 people from some of the most relevant players in the automotive sector in Portugal received and distributed the questionnaire to their employees in the different departments. These organisations reported that the success (or lack thereof) in the number of answers was related to its extension, explaining the mere 64 responses received. The sample size was then identified as a drawback because it is neither extremely large nor minimal; the survey's length, discouraged many potential respondents when they realised how long the questionnaire was.

An additional limitation of the research was that only five of the questionnaire's eighteen constructs were chosen following a comprehensive and rigorous evaluation of the literature reviewed, the study's objectives, hypotheses, and research questions. The five selected constructs were the most pertinent to be analysed and corresponded to this study's end goals.

Finally, because this study is specifically focused on the automotive sector, it is advised to be cautious when extrapolating the findings. The arguments put forth in this study are not sector-neutral or industry-neutral, so the indications of the relationships hypothesised may differ across sectors or industries.

In this study, it was determined that adaptability enables organisations to better face future obstacles, so those with a high degree of adaptability are more able to respond, adapt and innovate in response to incoming challenges. As a result of these current results, there are high hopes that future management scholars can focus on integrating the concept of adaptability to specific activities and empirically explore its potential benefit in preparing an organisation for future foreseeable threats.

For further study, an important issue to address is whether, through adaptability, changes occur within a few years in organisations in the automotive sector and, if so, what is the nature and extent of these changes. Another study topic for the future is whether reduced adaptability leads to lower performance or if its influence depends on the magnitude and direction of change in the economic, political, and social environments.

More, the application of this research in the same industry with a larger, more diverse sample would also be very interesting. Future research may incorporate additional factors that may impact these constructs to conduct more complex analyses (for example, to assess the relationship between the constructs). Goal congruence (the degree to which employees believe they share professional goals with co-workers), proactivity (a measure of employees' propensity to take the initiative), and role ambiguity (the extent to which employees believe their organisation provides insufficient information about their job duties) could all be additional factors to consider in future research.





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**Annexe:**

**Tables and Graphs**

*Table 14: Descriptive statistics regarding job tenure in years*

<b>Job Tenure in Years</b>		
<b>TOTAL</b>	64	1
<b>0-5</b>	23	35.9%
<b>6-10</b>	5	7.8%
<b>11-15</b>	8	12.5%
<b>16-20</b>	11	17.2%
<b>more than 20</b>	17	26.6%

*Table 15: Descriptive statistics regarding position tenure in years*

<b>Position Tenure in Years</b>		
<b>TOTAL</b>	64	1
<b>0-5</b>	28	43.8%
<b>6-10</b>	9	14.1%
<b>11-15</b>	11	17.2%
<b>16-20</b>	8	12.5%
<b>more than 20</b>	8	12.5%